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ABSTRACT OF THE RESERACH PROJECT

Mosquitoes such as *Anopheles gambiae* and *Culex quinquefasciatus* are responsible for the transmission of several parasites that cause diseases such as malaria and filariasis. In sub-Saharan countries as Senegal, the infection rate of malaria is mainly due to rapid urbanization. Chemical and mechanical methods are the most common for mosquito control. In the mosquito vector control, many efforts have been made in developing countries as Senegal. One of the major strategies in the fight against malaria is the personal protection using insecticide-treated nets and more recently, insecticide-treated nets with long duration of action. However, the continued use of insecticides has caused enormous problems as development of mosquito resistance. Biological control of malaria mosquitoes in Senegal, has rarely been used in vector control programs. Currently, biological control using natural products such as entomopathogenic fungi, is very promising. In our previous work, we showed the effectiveness of plant products (neem) and entomopathogenic fungi (*Metarhizium* sp and *Aspergillus clavatus*) against mosquito larvae and adults. In parallel, we showed the population dynamics of mosquitoes (*Anopheles gambiae* s.l. and *Culex quinquefasciatus*) that develop in the suburbs of Dakar from 2009 to 2010. In this project, we must collected species of *Anopheles* sp in many places of the suburbs of Dakar. The works will be followed at the University of Liege: Gembloux Agro-Bio Tech (Belgium). At the laboratory (Unité d'Entomologie évolutive), we must first master the techniques of molecular biology study and determined by molecular technique based on PCR arrays, the mosquito species previously collected in the suburbs of Dakar (Senegal). With *Metarhizium* sp and *Aspergillus clavatus*, We'll do the extraction and molecular characterization of enzymes released during their aggression activity (adhesion, penetration and sporulation) against mosquitoes (larvae and adults). Substances (chitinases, proteases and toxins) extracted by the method of culture on liquid medium, will be used to show their toxic effects against mosquitoes. With entomopathogenic substances, we will exanimate the mosquito larvae and adults behaviors during bioassay application and the oviposition of females. Histopathology electron microscopy will be conducted to show the damages to the larvae. At the end of this study, we'll have a protocol for the formulation of bio-pesticides of entomopathogenic fungi origin against mosquitoes. After that, these products will be locally formulated.

In Senegal, in order to use them against vector mosquitoes as *Anopheles*, *Aedes* and *Culex* genera, the popularization of this new method will bring a great interest for malaria control.